ING. O. FIORENTINI S.R.L.
INDUSTRIAL CLEANING MACHINES

# SCRUBBER MACHINE
# MOD. ET 70 RULLI
# WITH CYLINDRICAL BRUSH

# USER MANUAL

**Congratulations for your choice!**

***ING. O. FIORENTINI S.r.l.*** *thanking you for the preference to our product would like to remind you that ING. O. FIORENTINI's S.r.l production covers manufacture and marketing of industrial cleaning machines and is currently a leading company in this sector.*

*Our tradition and competence guarantee technical quality of your choice; actually all our products are being built first quality materials through criteria that can give reliability, solidity and functionality satisfying every kind of customers. FIORENTINI has recently obtained the quality system certificate conforming to the requirements of UNI EN ISO 9001:2000.*

*We wish therefore inviting you to contact us, unhesitatingly, for every kind of request, as technical or commercial; we'll be pleased to be at your disposal for any information you may need.*

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# 1. GENERAL INFORMATION

## 1.1. SYMBOLS

| | |
|---|---|
| | *This symbol is used to get the operator's attention on procedures or precautions to be followed in order to avoid damages to users or to the support* |
| | *This symbol is used to get the operator's attention on general information.* |

## 1.2. PREMISE

***FIORENTINI S. r. l.*** *is the only owner of this manual.*
*The reproduction of all or part of the manual or the transmission to third parties with mechanic or electronic devices is forbidden without a written manufacturer's authorization. This manual is supplied to the customers in one original copy when differently specified during the order.*

*This manual is supplied to the customer with the machine and it must be kept with it even when the machine has to be transferred.*
*Please, keep the manual in a safe place and for all the machine lifetime. Purchaser is responsible for showing the manual to qualified people. In case of loss ask for a duplicate to FIORENTINI Co..*

*FIORENTINI S.r.l. is not responsible for any kind of damages caused by people or things due to the non-observance of the instructions of this manual.*

*FIORENTINI reserves the right to add at any time and without notice all the technical and commercial changes considered useful for the customer. Therefore data and information in this manual can be updated.*

## 1.3. MANUAL CONSULTING

This manual deals exhaustively with all arguments that are necessary for an easy and safe use of the machine as it is recommended by European Directives on product safety.

Therefore we suggest to all authorized operators to read carefully this manual contacting FIORENTINI S.r.l. for any explanation. The manual has to be used every time the operator forgets a procedure or when new operators have to be trained.

For publishing reasons, pictures and drawings can look different from the reality but without arising doubts.

Special symbols and **bold type** and/or *sloping* get the attention of the reader on remarkable information in particular for safety.
The revision index is written on the left at the bottom of every page. The list of those pages that have been updated has to be found at the end of the manual.

## 1.4. WARRANTY

Warranty conditions are stated as below when not differently specified in the order confirmation.

WARRANTY OBJECT

The machine has been designed and built for a long-lasting use without relevant problems. Anyway, if problems arise during the warranty period, FIORENTINI S.r.l. is engaged to repair or substitute for free those parts that are broken or damaged by defective materials, working defects or imperfect assembly.
Warranty is not given for parts whose early breaking or wear and tear are due to:

- Non-respect of instructions included in this manual;
- Breaking and/or changes made up without FIORENTINI's approval;
- Not-use of genuine spare parts;

- Interventions made up by unauthorized personnel;
- Missing maintenance;
- Natural calamities.

FIORENTINI S.r.l., its purchasers and its suppliers have the same warranty for the electric and expendable materials that are sold by external suppliers.

WARRANTY CONDITIONS

The warranty is granted for 24 months since the machine delivery date. This is a single warranty term and it cannot be extended.

APPLICATION MODALITY

Defective components must be sent back to FIORENTINI S.r.l. in order to establish the anomalies causes and apply therefore the warranty. Repair and replacement under warranty will be done in FIORENTINI's workshop, by third parties or in loco. In case of repair or replacement in loco, energy sources and the use of particular equipment have to be paid by the customer himself.

GOODS TO BE RETURNED

In case of goods to be returned for warranty replacement, it is necessary to have a written acceptance from FIORENTINI technical department before sending them.
All defective parts must be carefully packed in order to avoid further damages during transport.
Goods must be shipped ex-warehouse and followed by :

- **serial number of the equipment where they were installed on;**
- **item code of the defective part;**
- **detailed description of the defect and of the condictions where it happened.**

In case of defective electric or electronic goods,
please return them separately from other materials,
in order to help us in dividing dangerous wastegoods
and recicle the (RAEE) as DER 2002/96/CEE LOW.

EXCEPTIONS

Expandable materials like brushes, squeegee blades and materials whose lifetime cannot be predetermined are not under warranty.

*The machine warranty is no more available in case of the loss of the silver label.*

## *1.5. CONFORMITY DECLARATION*

The conformity declaration is released with the machine and the user manual.

# DICHIARAZIONE CE DI CONFORMITA'

**ING. O. FIORENTINI s.r.l.**
Loc. Rombola

**50030 PIANCALDOLI (FI) ITALIA**

**DICHIARIAMO SOTTO LA NOSTRA RESPONSABILITA' CHE LA MACCHINA**

**Marca** FIORENTINI
**Tipo**
**N° serie**
**Anno di costruzione** 2005

**RISULTA IN CONFORMITA'**
**con quanto previsto dalle seguenti direttive e normative armonizzate comunitarie:**

**DIRETTIVA COMUNITARIA**

**DIRETTIVA MACCHINE**

**98/37/CEE**

**DIRETTIVA COMPATIBILITA' ELETTROMAGNETICA**

**89/336/CEE**

Ing. O. Fiorentini S.r.l.
Il titolare
Ing. O. Fiorentini

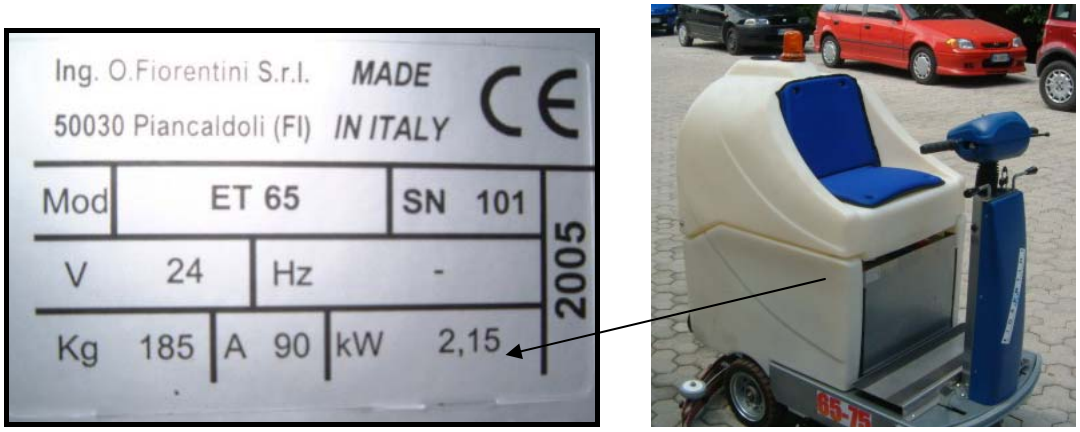
Piancaldoli
***Luogo e data***

***Firma***

# 2. MACHINE FEATURES AND TECHNICAL DATA

## *2.1. IDENTIFYING THE MACHINE*

A silver label is stuck on the protection case of the steering column and clearly shows the data referring to the “CE” marking.




**Picture 2.1**

| | |
|---|---|
| | *The label has never to be removed and should always be kept readable. In case of damage it is necessary to ask for a duplicate. The autoscrubber machine cannot be sold without the label.* |

## *2.2. DESCRIPTION AND COMPONENTS*

The scrubber machine – ET 70 RULLI - has been designed for the cleaning of all flat surfaces by means of washing and suction of the washing water.
The electric traction system is supplied by a series of batteries which supply energy to the brushes motors, to the squeegee motor and to the suction motor.
The machine is equipped with two rotating cylindrical brushes which wash the surface by means of water and detergent. Whilst the machine is running forward, the back brush (squeegee) picks the water up that is directly sucked into the recovery tank.
The accelerator pedal starts both the washing brushes and the suction motor which stop automatically after a few seconds when you leave the pedal. When the washing brushes standstill, they are no more in contact with the ground. In this way the bristles will not be damaged while the brushes are not working.
Thanks to the dashboard the operator can control all the machine functions and a series of LEDs shows to the operator the battery status or the errors detected by the electronic card.
The operator can control all the main machine functions and in particular:

- Start the washing brushes;
- Regulate the quantity of water;
- Start the suction motor;
- Start the lift or the sink of the squeegee;
- Choose the forward or back gear;
- Start or stop the machine.

The machine frame is made of zinc-plated or stainless steel in order to avoid oxidation which could compromise the machine reliability.

The main parts of the machine are:

- Zinc-plated steel or stainless steel frame;
- PE-HD plastic solution tank;
- PE-HD plastic recovery tank supplied with flexible suction piping system and drainage;
- Series of batteries placed in the recovery tank room;
- No. 2 rotating cylindrical brushes;
- Squeegee (suction system);
- Water recovery system;
- one driving wheel;
- two idle wheels;
- steering wheel;
- driving seat.

FIORENTINI Co., taking the new CE safety rules into consideration, manufactures the machine following the CE directives about safety and health. The materials high quality, the high technology and FIORENTINI's experience guarantee the performance and the reliability of this machine.
Each machine is tested during the manufacturing process and the final check is done before the machine is shipped out.

## 2.3. TECHNICAL DATA

***CARATTERISTICHE TECNICHE – TECNICAL CHARACTERISTICS – CARACTERISTIQUES TECHNIQUE***

| | **ET70-RULLI** |
|---|---|
| Alimentazione – Voltage – Alimentation | **24 V (6 x 4 V – 330 Amp/h)** |
| Sistema di trazione – Drive system - Systeme de traction | **Motoruota Anteriore 24V 700W** |
| Larghezza di lavaggio – Scrubbing width – Largeur de nettoyage | **700 mm** |
| Larghezza squeegee – squeegee width – Largeur suceur | **900 mm** |
| N° spazzole – Brushes no. – Nr. des brosses | **2 CILINDRICHE Ø 105 x 700mm** |
| Pressione spazzole – Brush pressure – pression des brosses | **30 Kg.** |
| Area pulita per ora – Working capacity up to – Rendement jusqu'à | **4500 mq/h** |
| Autonomia – Autonomy - Autonomie | **5 h** |
| Serbatoio soluzione – Solution tank – Cuve solution | **125 litri** |
| Serbatoio di recupero – Recovery tank – Cuve recuperation | **105 litri** |
| Depressione – Water lift – Depression | **1800 mm $H_2O$ / 16 Kpa** |
| Cassetto portarifiuti – Waste tank – Reservoir dechets | **7 Litri** |
| Velocità di marcia avanti – Forward speed - Vitesse en marche avant | **0 – 6 Km/h** |

***CARATTERISTICHE TECNICHE MOTORI – TECNICAL CHARACTERISTICS – CARACTERISTIQUES TECHNIQUE***

| | |
|---|---|
| Motore trazione – Traction motor – Moteur des tracion | **24 V - 700 W** |
| Motore aspirazione – Suction motor – Moteur d'aspiration | **24 V 600 W** |
| Motore spazzole – Brush motor – Moteur des brosses | **N°2 x 400 W 24 V 20 A 1500 rpm** |

**DIMENSIONI – DIMENSIONS**

| | |
|---|---|
| Lunghezza – Length – Longueur | **1170 mm** |
| Larghezza senza carter spazzole- Width without brushes carters – Largeur sans carter brosses | **640 mm** |
| Larghezza con carter spazzola - Width with brushes carters Largeur avec carter brosses | **730 mm** |
| Altezza – Height – Hauteur | **1260 mm** |
| Peso senza batteria – Weight without battery – Poids sans batteries | **185 Kg.** |
| Guida – Drive -Conduite | **Uomo a Bordo** |
| Corridoio min. per inversione ad U – Minimum aisle turn – Place pour demi-tournage | **1720 mm** |
| Pendenza max. superabile – Max. gradient at full load – Pente superable | **7 %** |
| Rumorosità. – Noise level – Bruit | **< 70 dB(A)** |

*The above mentioned characteristics are not binding for the manufacturer; they can be changed without any notice. ING.O.FIORENTINI Co. is always at disposal for any information (par.7.1.).*

| MEASUREMENT UNITS CONVERSION | | | |
|---|---|---|---|
| **Lenght** | 1 inch = 1” = 25,4 mm | **Power** | 1 kW = 1,36 CV = 1,34 BHP |
| **Temperature** | T (K) = t (°C) + 273 / t (°F) = 1,8 t (°C) + 32 | **Pressure** | 1 bar =100 kPa = 14,5 psi |

# 3. SAFETY

## *3.1. RIGHT USE OF THE MACHINE*

***This machine is a scrubbing machine and it has been designed and built to clean in an industrial place. It can work on flat surfaces or on sloping surfaces not higher than 10% and with a speed not higher than 1 km/h while the machine is reversing.***

## *3.2.* WRONG USE OF THE MACHINE

- ***The machine cannot be driven by non-authorized personnel;***
- ***The machine cannot wash sloping surfaces whose gradient is higher than 10% or surfaces with holes;***
- ***The machine cannot reverse with a speed higher than 1 km/h;***
- ***The machine cannot be used in places with dangerous substances and in particular with explosive atmospheres or with a bad microclimate;***
- ***The machine cannot clean surfaces with inflammable products;***
- ***The machine cannot be used as a means of transport for people or other means of transport;***
- ***The protection devices of the machine cannot be modified or tampered;***
- ***Batteries must be recharged in a fanned room;***
- ***The operator have always to respect safety rules;***
- ***The operator cannot use equipments or devices that can create problems to the machine working;***
- ***The machine components cannot be modified without FIORENTINI's authorization;***
- ***The operator cannot use acids that can damage the machine;***
- ***The operator has always to respect the rules written in the user manual.***

*Please read carefully and do not cover the labels stuck on the machine. FIORENTINI S.r.l. is not responsible for a wrong use of the machine (see § 3.2.)*

## *3.3. SUGGESTED EQUIPMENT*

In order to use the machine in a proper way, we suggest to use the FIORENTINI's equipment and original spare parts.
FIORENTINI S.r.l. Technical Dept. is always at your disposal to design components or parts for a particular use of machine as requested by the customer.

### 3.4. OPERATOR'S QUALIFICATIONS

The scheme below summarizes the operator's qualifications requested for each kind of operation.

| OPERATION | OPERATOR'S QUALIFICATIONS |
|---|---|
| Driving/control of the machine | Trained operator |
| Installation/ disinstallation | Fiorentini technician |
| Mechanical parts maintenance | Fiorentini technician |
| Electric parts maintenance | Fiorentini technician |
| Cleaning maintenance | Trained operator |
| Dismantling and demolition | Fiorentini technician |
| | |

FIORENTINI S.r.l. suggests to train the operator before using the machine. The operator also must be trained about safety rules and carefully read this manual.

*FIORENTINI S.r.l. is not responsible for any possible damage to people and/or things caused by the non-observance of the instructions dealt within this manual.*

### 3.5. SAFETY AND WARNING DEVICES

- ***It is absolutely forbidden to tamper or disconnect safety and warning devices while the machine is working;***
- ***It is important to check periodically safety and warning devices (see § 5.1.).***

| | |
|---|---|
| **Side brushes protection** | ET 70 RULLI is equipped with two rotating cylindrical brushes made of nylon. The machine cannot reach dangerous areas thanks to fixed steel protections set up on each brush. These cases can be only willingly removed. |
| **Emergency seat switch** | This machine is equipped with an emergency switch under the driving seat. It avoids that the machine starts when the operator is not on board. |
| **Warning devices** | ET 70 RULLI is equipped with several warning devices:<br>➢ One acoustic warning device like a horn. It has to warn people who are near the machine while its operating;<br>➢ One intermittent bleeper to warn people while the machine is reversing;<br>➢ Two flashing yellow lights to signal the machine operating. |

### *3.6 SAFETY SYSTEMS*

The machine is equipped with the following safety systems:

- **Socket** (picture 4.5), the same socket used for the battery charger. In case of emergency, this socket must be taken away from the plug by means of its handle.
  The operator must be trained about safety rules. Do never restore this safety system before the problem has been sorted out. If it is necessary ask for the technician help.

- **Emergency button:** the machine is equipped with an emergency button under the driver's seat. If the operator is not aboard, the machine does not start. Moreover, the machine stops automatically if the operator forgets to switch the machine off. In this way the operator must seats again on the machine, switch the machine off, wait for a few seconds and start the machine again.

- **Float:** inside the recovery tank there is a floater that stops the suction of the machine if the tank is too full. To start the machine again the operator has to empty the recovery tank (see § 4.5.7.).

- **Electro valve (optional):** the machine is equipped with an electro valve which avoids water to go out when the brushes are switched off.

- **Float timer (optional):** the machine is equipped with a timer installed on the float which avoids oscilling water to switch the vacuum motor off.

### *3. 7 SAFETY DIAGNOSTIC SIGNALING*

The electronic card is equipped with a particular system which shows the machine errors through quick flashings on the battery charger display placed on the dashboard.
The number of switched on LEDs represents one of the errors listed below:

| n.° flash | Description | Solution |
|---|---|---|
| 1 | The gear command is already active on ignition: the ignition key has been activated when the gear command was already plugged in. | It is required to release the gear command in order to eliminate the flashing signals. Should this not happen, it may be necessary to reset the acceleration system. |
| 2 | Battery too unloaded or subject to tension caused by a short circuit on the power. Indicates that the tension of the system is lower than the minimum level required for a proper functioning. | Verify that the battery is not too unloaded and if necessary reload the battery. Alternatively verify whether any electrical connections are loosened. If this doesn't solve the problem, it may be necessary to replace the system. |
| 3 | Maximum tension on the battery. Indicates that the tension is too high and could break the regulator. | |
| 4 | Motor not connected or wrong contact on the motor circuit. This may happen when the motor brushes do not correctly lie on the rotor or when cables are loosened. | Verify the connections, the functionalities and the integrity of the motor. |
| 5 | Internal fault of the regulator or earth on the motor. | There could be a negative dispersion on the motor circuit; alternatively, verify the regulator. |
| 6 | | |
| 7 | Temperature of the power circuit is too high; this happens when the temperature of the mosfet is higher than 75°C +/- 5°C, i.e. when the machine has worked in overload conditions, e.g. on too steep slopes for too long, or in working temperature higher than 40°C. This may also happen in case of damage of the winding of the motor, which may lead to unusual absorption of current. | Wait until the temperature has cooled down. |
| 8 | Motor is already working on start. Indicates that the machine is being starter when it is (or its motor) is already working. | Stop the machine and thereafter do it again |
| 9 | Software fault of the microcontroller or hardware problem. This may happen in case of faults to the circuits, which measure the current and the loads. | Try to stop and then restart the machine. If the fault appears again it is required to verify the regulator. |
| 10 | Battery empty, indicates that there occurred a blocking of the brushes. | Recharge the battery |
| | | |

### *3.8. OTHER DANGERS*

FIORENTINI S.r.l. analyzes – starting from the design of the machine - all the dangers that can occur while the machine is operating in order to prevent or at least lower the operator's accidents. Thanks to a series of signals on the machine the operator can avoid many risks that can occur.

**CRUSHING**

This kind of danger can occur:

- **During replacement of cylindrical brushes;**
- **During battery recharge because of the fall of the recovery tank.**

**Whilst replacing the cylindrical brushes, the ignition key must be kept away from the dashboard in order to avoid the casual starting of the machine.**
**Whilst the batteries recharge, the operator must pay attention that any parts of his/her body enter the batteries room.**

| | |
|---|---|
| | *Special labels stuck on the carters of the brushes or on the recovery tank prevent dangers to the operator (see § 3.7.).* |

**SQUASHING AND SHEARING**

This kind of danger can occur:

- **while the operator is regulating the steering wheel by means of the pedal.**

**The operator must only use his/her legs during the regulation of the steering column.**

**Squashing and shearing danger is highlighted by special labels stuck on the case of the steering column (see § 3.7.).**

**TURNOVER**

This kind of ranger can occur:

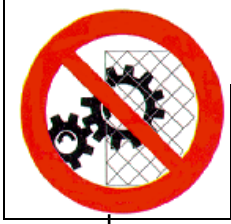
- **during the normal operating of the machine when you exceed sloping limits as specified in the manual and you use the machine to clean disconnected surfaces or with holes and high depressions (photo 3.2)**

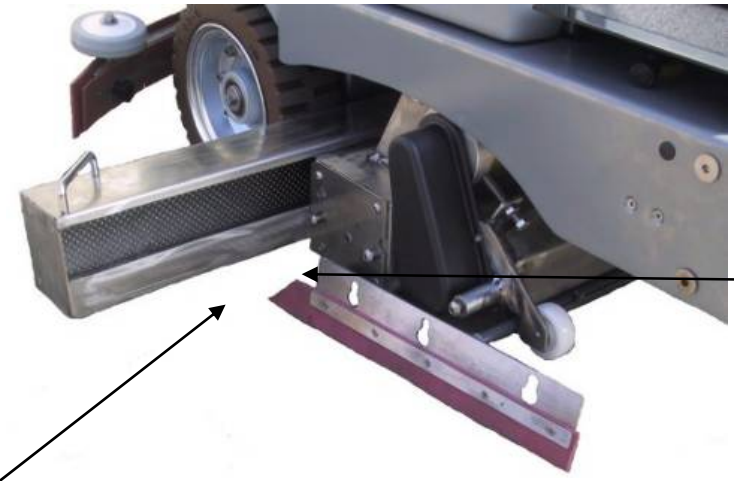
| | |
|---|---|
| | **Do not use the machine to wash sloping surfaces higher than 5% or surfaces with holes or depressions which might compromise the stability of the machine.** |

| | |
|---|---|
| | *FIORENTINI is not responsible for accidents occurred to people or things provoked by a wrong use of the machine, i.e. using the machine on surfaces which can compromise its stability.*<br>*The purchaser must stick proper labels on the machine to show the operator the right use of the scrubber.* |

### *3.9. SAFETY SIGNALS*

| | | |
|---|---|---|
| DANGERS | | Dangers' signals are triangular with black pictures on a yellow background |
| PROHIBITIONS | | Prohibitions' signals are round with black pictures and a red stripe |

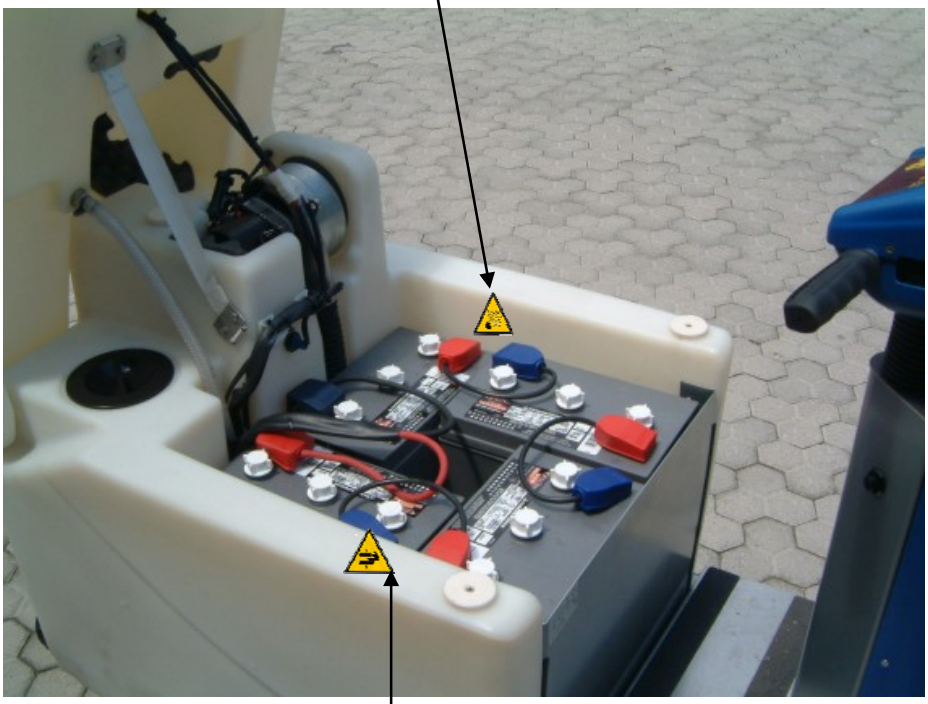
| | | |
|---|---|---|
|  | **What is it?** | This signal forbids to remove the protection of pieces in movement. |
| | **What to do** | During the installation or the maintenance make sure that the ignition key is not in the dashboard before removing the mobile protections. While the machine is operating make sure that all covers are well fixed. |



| | | |
|---|---|---|
| | **What is it?** | Squashing danger: it can be due to parts in movement of the machine. |
| | **What to do** | During the installation or the maintenance make sure that the ignition key is not in the dashboard before removing the mobile protections. |

***The purchaser must replace danger signals on the machine if they are deteriorated. It is absolutely forbidden to remove or temper danger signals.***

| | | |
|---|---|---|
| | **What is it?** | Explosion danger: it may occur while recharging the batteries because of hydrogen spread. |
| | **What to do** | During the batteries recharge, please place the machine under a suction chimney or in a ventilated area and keep it away from heat and corrosive substances. |



| | | |
|---|---|---|
| | **What is it?** | Squashing danger: it can be provoked by the recovery tank overturn. |
| | **What to do** | During the batteries water filling, pay attention to the recovery tank casual fall. |

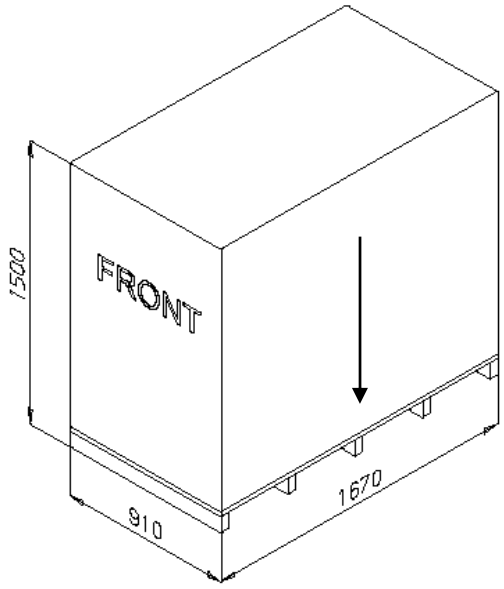
***The purchaser must replace danger signals on the machine if they are damaged. It is absolutely forbidden to remove or temper danger signals.***

# 4. STARTING AND USE INSTRUCTIONS

## *4.1. TRANSPORT AND HANDLING*

The machine is delivered to the purchaser in a proper package (see picture 4.1 below). A black arrow on the package indicates the barycentre. This arrow must be in the middle of the elevator or transpallet forks. The package must be carefully handled. Do not place one package on another one. If agreed with the purchaser, the machine can be delivered without package, placed on a pallet and fixed by means of straps.

| | |
|---|---|
| | *The purchaser must make sure that the machine has not been damaged during the transport and that all papers are on the machine. Otherwise, the purchaser must immediately contact FIORENTINI in order to sort out the problem.*<br>*The purchaser is responsible for the transport of the machine if not differently agreed with FIORENTINI.* |




**Picture 4.1**

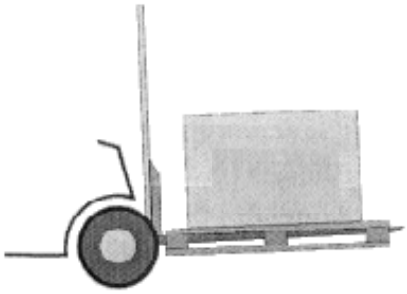
The machine must be handled with proper devices as stated in the scheme below. Please, make sure that the black arrow on the package are always in the middle of the elevator forks or the sling bands.

| PACKAGE | HANDLING EQUIPMENT | PICTURE |
|---|---|---|
| Paperboard or plywood box on a pallet | Fork elevator | Nr. 4.2. |
| None | Fork elevator or crane truck with a two-band-sling and equalizer | Nr. 4.3. |

| | |
|---|---|
| | ***The bands used for lifting the machine up must have the same loading capacity as the machine load. Handling operations must be done without causing a loss of stability of the machine. Otherwise, the machine can be damaged or the operator can de in danger.*** |

*FIORENTINI suggest to use authorized personnel (see § 2.3.) to handle the machine.*

LOADING SYSTEM



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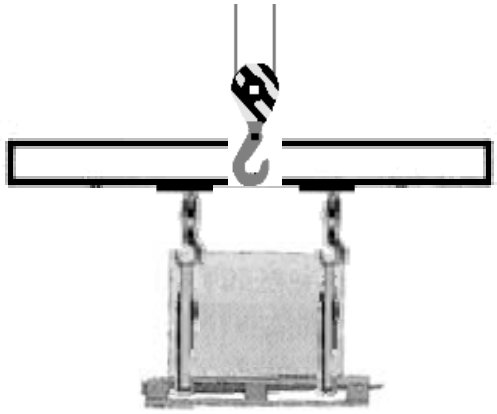


**Picture 4.2** **Picture 4.3**

### *4.2. STORAGE*

The machine must be stored in a closed and dry place if not immediately installed in order to keep every part safe.
Relative humidity must be lower than 80% and the storage temperature must be between 3°C ≤ t ≤ + 45 °C**.**

### *4.3. HOW TO UNPACK THE MACHINE*

- Cut the straps paying attention to the back spring;
- Remove the staples that join the paperboard and the pallet;
- If the package is mad of plywood, please remove the staples from each side;
- Cut the straps that fix the machine;
- Lay the machine on the floor.

### *4.4 HOW TO HANDLE THE UNPACKED MACHINE*

- Check the machine and install the batteries if not already installed;
- For a brief transport of the machine, please disconnect the batteries cables and remove brushes and squeegee; for a longer transport, please use the original package of the machine.

## *4.5. INSTALLATION*

| | |
|---|---|
| | *Installation must be carried out by authorized personnel after reading this manual.* |

### *4.5.1 BATTERIES INSTALLATION*

- Lift the recovery tank up in order to reach the batteries room (see detail 1 in picture 4.4);
- Install the batteries in their room (picture 4.4.) and make sure that the cases of the batteries are not broken;
- Never fill distilled water after having recharged the batteries.
- Clean the surfaces for the connections;
- The operator can easily lift the batteries up by means of handles.

**Picture 4.4**

### *4.5.2 BATTERY CHARGER INSTALLATION*

Batteries must be recharged in a place equipped with a proper suction system of gases spread during this operation. Otherwise, batteries must be charged in a ventilated and dry place far from heat sources and corrosive substances.
Protect the electric network with a delayed switch or with a fuse whose capacity is higher than the battery charger maximum input.
Control the battery outlet polarity.

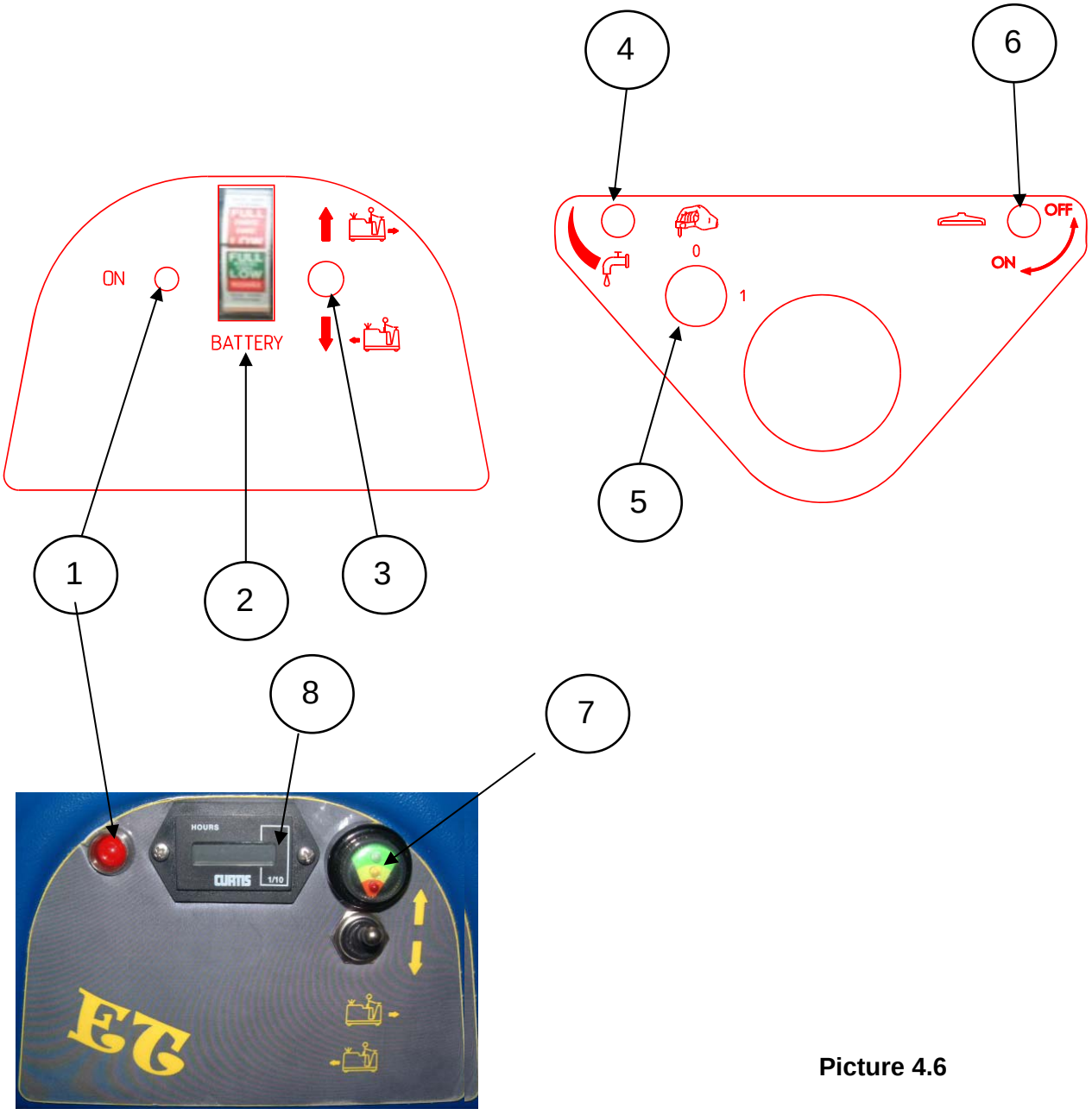
Connect the battery charger to the machine socket

**Picture 4.5**

## *4.6. CONTROL DEVICES*

### 4.6.1. DASHBOARD

The dashboard is made of a series of switches that activate or disactivate all the machine functions. The function of each switch is shown by a picture. Picture 4.6. shows the dashboard of the machine and the switches function is explained in the scheme in the following page.

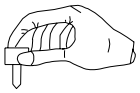
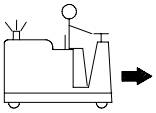
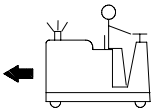
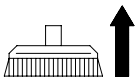
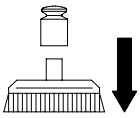
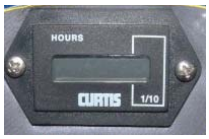
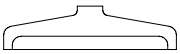
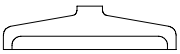



**Picture 4.6**

**OPTIONAL**

| | |
|---|---|
| 1 | SCRUBBER ON |
| 2 | BATTERY CHARGER INDICATOR |
| 3 | FORWARD/REVERSE SWITCH |
| 4 | SOLUTION LEVER |
| 5 | KEY SWITCH |
| 6 | SQUEEGEE UP LEVER AND SUCTION ENGINE ON |
| 7 | LED BATTERY INDICATOR (OPTIONAL) |
| 8 | HOUR COUNTER (OPTIONAL) |

# SYMBOLS ON THE DASHBOARD

| | | | |
|---|---|---|---|
| **0** | OFF | **1** | ON |
|  | Main switch | | Horn |
|  | Forward Gear |  | Riverse Gear |
|  | Washing Brushes On |  | Washing Brushes Off |
| | Batteries Charter Indicator |   | Hour counter |
| **ON**  | Suction On | **OFF**  | Suction Off |
| | Led battery indicator | | |

## *4.7. FUNCTIONING*

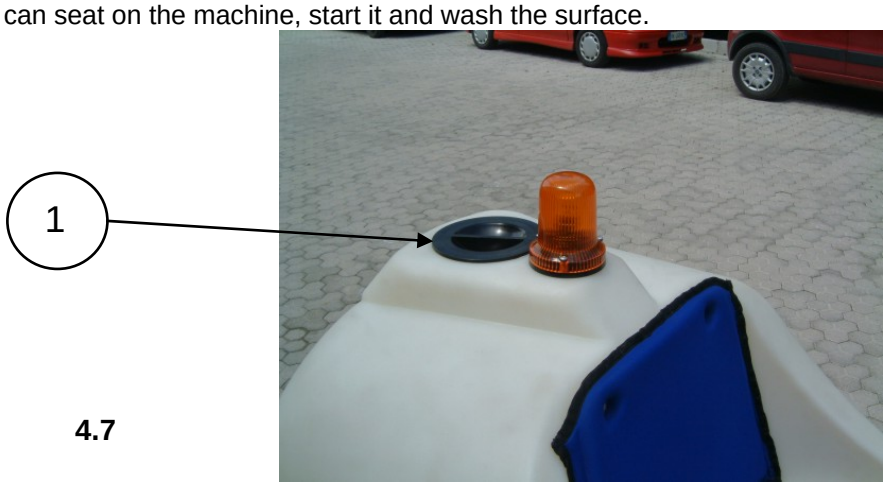
The operator, thanks to his/her experience, has to choose the right kind of brush and detergent for the surfaces that has to be washed and to decide if the floor needs a second washing.
By means of the brushes lifting pedal, the cylindrical brushes and the suction motor are activated. The vacuum motor and the brushes start when the forward pedal is pressed. On the contrary, both cylindrical brushes and the suction motor are disactivated after a few seconds if the operator leaves the forward pedal. Before the surface is completely dry, the operator must switch the solution solenoid valve off because this is not activated/disactivated by the accelerator pedal.
The operator has to do a second washing if the surface is particularly dirty:

1. wash the surface with the squeegee up and the brushes down;
2. activate the brushes;
3. press the solution solenoid valve switch;
4. leave the solution on the surface to dissolve the dirt;
5. do a second washing with brushes and squeegee down, the suction activated and the solution solenoid valve open.

*Before any operation, make sure that all protections are well fixed.*

### *4.7.1 PREPARING AND STARTING THE MACHINE*

If the machine is connected with the battery charger, the operator must firstly disconnect the battery charger plug from the batteries one and connect the batteries plug with the power supply plug (see picture 4.5.). Secondly, the operator must fill water lifting the recovery tank up and turning the cap (see detail nr. 1 in picture nr. 4.7.). Now the operator can seat on the machine, start it and wash the surface.




**4.7**

### *4.7.2 CHOOSING THE RIGHT DETERGENT*

Choosing the right detergent is very important for a perfect cleaning. A too strong detergent could damage the surface. A good quality detergent has to produce little foam. Alternatively, the operator can add an antifoaming additive or 50 cc of wine vinegar in the recovery tank in order to avoid the suction motor damage.

*Make sure that the detergent is suitable for the dirty surface. FIORENTINI S.r.l. is not responsible for damages provoked by too aggressive detergents.*

### *4.7.4 RUDDER BAR FUNCTIONING*

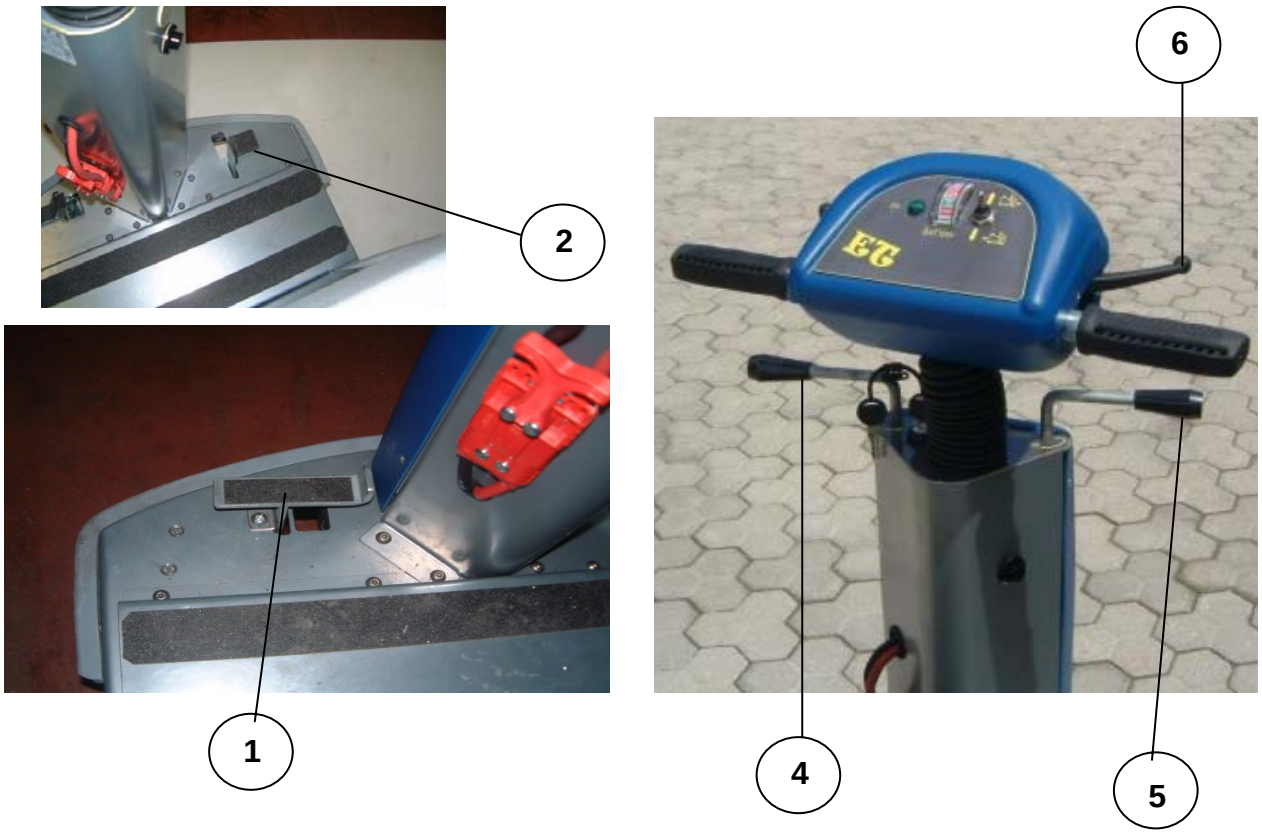
The rudder bar of this scrubber machine is composed by:

- Accelerator lever (see detail nr. 6 in picture nr. 4.9.): by means of the forward/backward lever and the accelerator lever, the machine moves forwards or backwards.

| | |
|---|---|
| | *The accelerator pedal activates all the machine moving parts. This is why the brushes and the suction motor are activated pressing the accelerator pedal and their switches on the dashboard. On the contrary, the accelerator pedal can't activate the solution solenoid valve, which has to be opened and closed by the operator.* |

- Service/Parking Brake (see detail 2 in picture 4.9). It has to slow and stop the machine. If the operator wants to set the service brake on, he/she has to press the service brake pedal (. If he /she wants to release the service brake, he/she has to press both the brake pedal and the release pedal and press the release knob.
- Brushes Plate up/down Pedal (see details 1 in picture 4.9). Press pedal nr. 1 laterally to low the brushes plate. To lift the brush plate press pedal no. 1 to the end.
- Solution lever (see detail 4 in picture 4.9). Turn the solution lever until the solution quantity that flows out is sufficient;
- Squeegee up Lever (see detail 5 in picture 4.9). The operator can low or lift the squeegee up turning this lever. At the same time, the suction engine is activated. Turning this lever to the opposite direction, the operator can lift the squeegee up and switch the suction engine off.

**Picture 4.9**

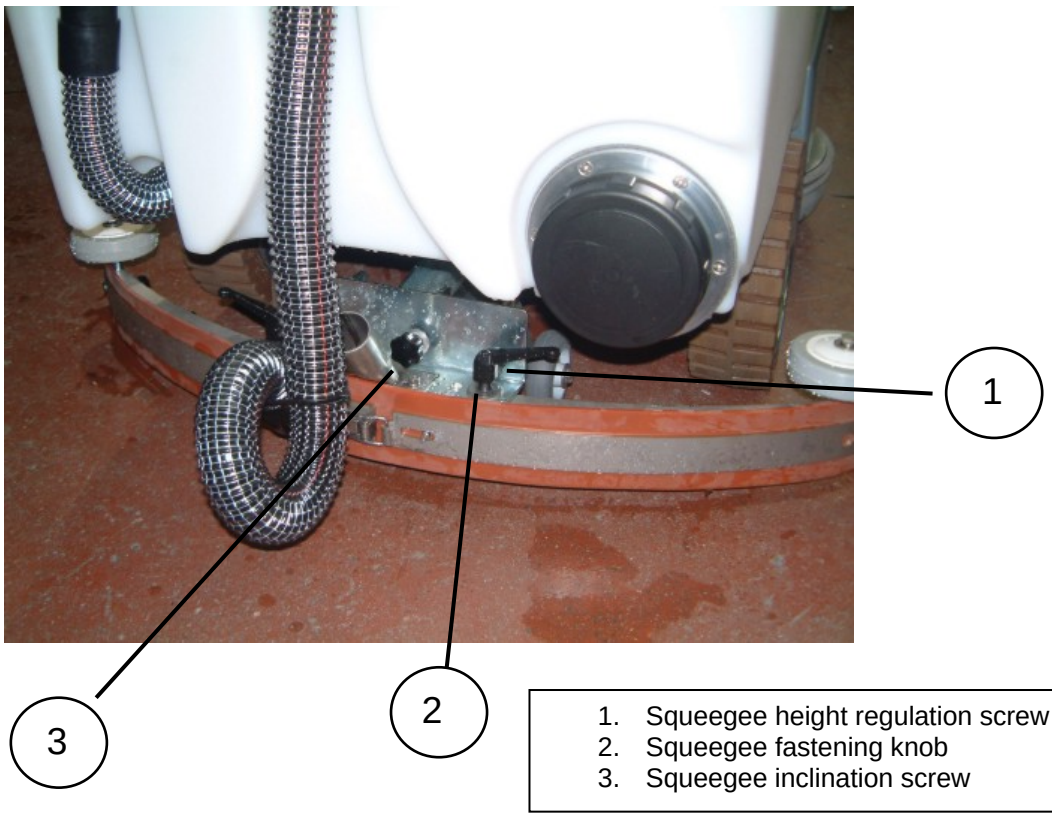


### *4.7.6 SQUEEGEE ADJUSTMENT*

The squeegee has to be well regulated in order to have a perfect dry system. This kind of squeegee can perfectly suck water, which flows into the suction pipe, but it must be parallel to the surface.

The operator has to follow the instructions below for the squeegee adjustment:

- Remove the ignition key from the dashboard in order to avoid the casual starting of the machine.
- By means of the knob (see detail nr. 3 in picture nr. 4.11.) regulate the squeegee. The best squeegee pressure is reached when the corner of its blade is in contact with the floor and their inclination is between 45° and 60°.




1. Squeegee height regulation screw
2. Squeegee fastening knob
3. Squeegee inclination screw

- Squeegee pressure regulation: the operator has to work on the squeegee driving wheels cam pins. The operator has to unloose the screw at the bottom of the pin by means of the spanner delivered with the machine. Afterwards the operator has to tighten this screw again.

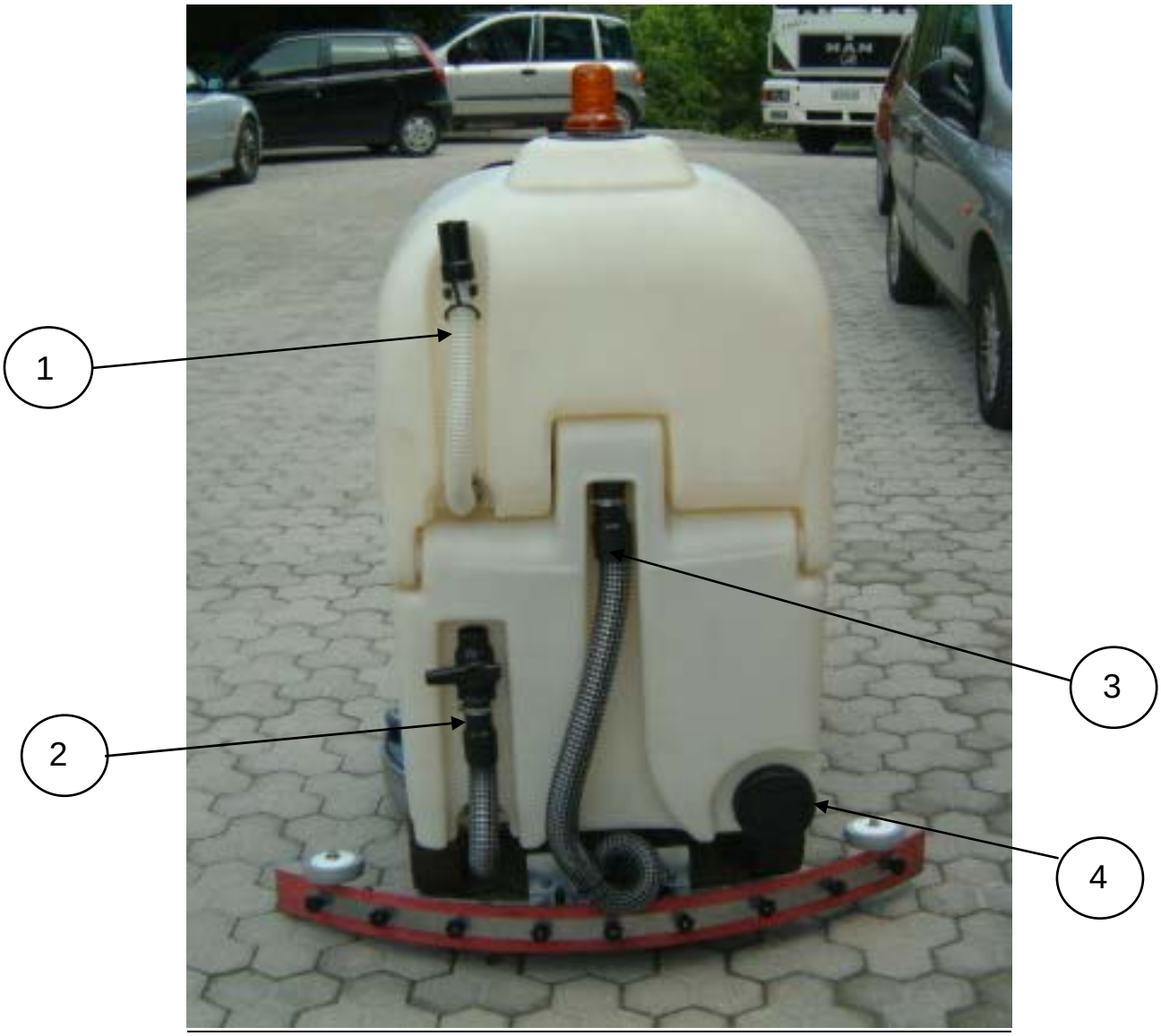
*Make sure that the two wheels of the squeegee are well regulated in order to keeps both its blades parallel to the floor.*

### *4.7.7 WATER DISCHARGE*

This scrubber machine is equipped with two hoses for water discharge (picture 4.15.):

- Solution tank discharge hose (see detail no. 1 in picture nr. 4.15.);
- Recovery tank discharge hose (see detail no. 2 in picture nr. 4.15.);
- Vacuum hose (see detail no. 3 in picture no. 4.15)
- Recovery tank cap (see detail no. 4 in picture no. 4.15.).

To discharge water from the tanks, place the machine on a dump well, release the pipe of the tank and open the rubber cap at the end of the pipe itself.

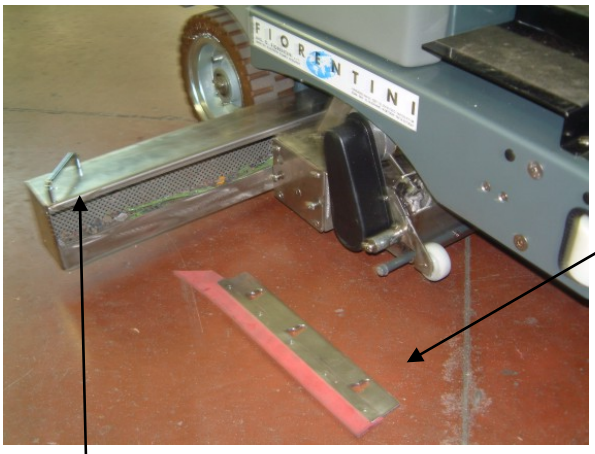



**Picture 4.15**

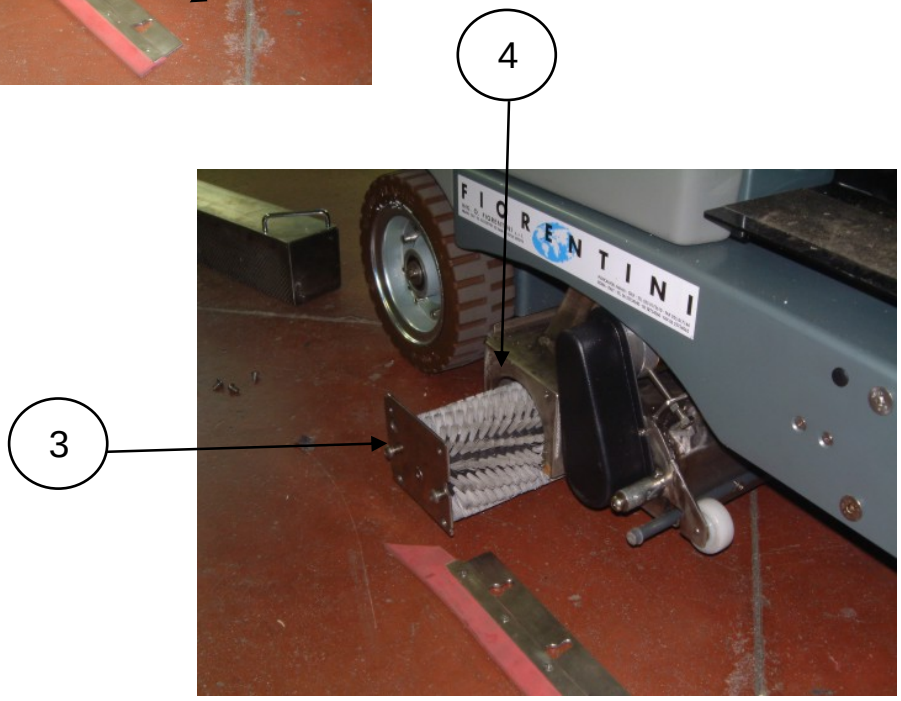
### *4.7.9 BRUSHES REPLACEMENT and DIRTY CONTAINER EMPTYING*

Please follow the instructions below:

- Remove the ignition key from the dashboard in order to avoid the accidental start of the machine;
- Remove the side listel lifting it up (see detail 1 in picture 4.17).
- Remove the dirty container pulling it from the handle and clean it, (see detail 2 in picture 4.17);
- To replace the left cylindrical brush unscrew the 4 screws on the side panel (see detail 3 in picture 4.18); Repeat the same action to remove the right cylindrical brush.
- After having replaced both cylindrical brushes, insert the dirty container and fix the two side listels.




**Picture 4.17**



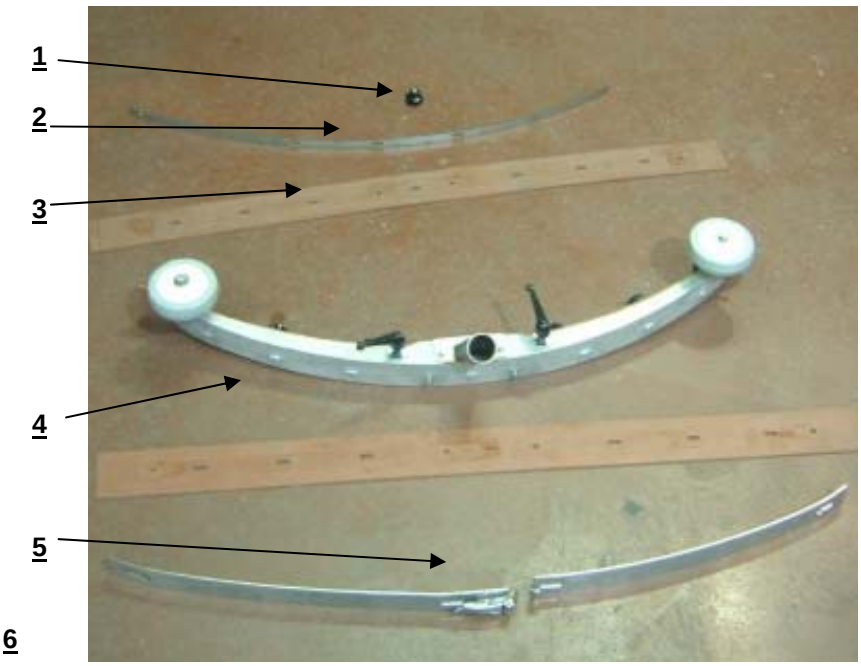

**Picture 4.18**

*Before starting the machine again, please make sure that all the protection cases are well set up.*

### *4.7.10 SQUEEGEE BLADES REPLACEMENT*

Squeegee blades must be replaced when their hedges are worn. A perfect hedge allows a perfect dry (picture 4.19).
Please follow these instructions to replace the squeegee blades:

- Remove the squeegee from the machine and lay it on a table;
- Remove all inside knobs (see detail 1), unloose the steel strip (see detail 2) and take off the consumed blade (see detail 3)
- Remove the hook of the outside listel (see details 5), take off the two listel parts and remove the blade (see detail 4)
- Set the new blades, reassemble the squeegee and regulate it.
- If necessary, replace also the bumper wheels unscrewing the hexagonal screws (see detail 6)



# 5. MAINTENANCE

## *5.1. PERIODICAL MAINTENANCE*

A periodical maintenance is very important.
Please write down in the format you find below all the interventions done on the machine.

- *Trained personnel only can service the machine and especially electric and electromechanical parts by means of suitable tools and equipments.*
- *Make reference to FIORENTINI S.r.l. only for service and spare parts (§ 7.1. and § 7.2.).*

| ***OPERATION*** | ***INTERVENTION*** | ***HOW OFTEN*** |
|---|---|---|
| Cleaning | Clean the recovery tank and the oil filter of the suction motor | Every day |
| | • ***Do not use corrosive substances.*** • ***Do not use bolts of water.*** | |
| | ➢ Check the suction pipes and the squeegee | Every week |
| Check up | ➢ Check the rubber suction blades of the squeegee<br>➢ Check the water battery level | Every 15 days |
| | Check the filter of the clean water tank | Every month |
| | Check and regulate the breaking system | Every 3 months |
| | Check the connection of the battery cables | Every 6 months |
| | Check the brushes of each motor | Every year |
| | ➢ Check the safety devices<br>➢ Check the electric system | Every year |

## *5.2 BATTERIES MAINTENANCE*

The operator has to check the batteries charge when the machine is on duty by means of the indicator on the dashboard, which shows:

- ➢ Green light: charged battery
- ➢ Yellow light: slightly charged battery
- ➢ Red light: uncharged battery

*The operator must keep the battery room open during the batteries recharge. Moreover:*

- ➢ *It is forbidden to use flames and/or to smoke near the batteries;*
- ➢ *Pay attention to the battery acid;*
- ➢ *Do not develop sparks near the batteries;*
- ➢ *Pay attention to the batteries gazes, which can burst;*
- ➢ *Do not invert battery polarities.*

### *5.2. HYDROMETRY*

In order to check the batteries hydrometrics the operator has to follow the instructions below:

- By means of a hydrometer draw a small quantity of electrolyte so that the floater reaches the surface;
- Make sure that the floater inside the hydrometer is not blocked;
- For a new measurement, after having filled the batteries with distilled water, the operator has to wait until the liquid inside each battery becomes homogeneous.

### *5.2.2 WATER FILLING UP*

- Fill distilled water up in each battery cell before the recharge. The liquid inside the batteries has to be of 6 mm. over the plates;
- The operator has to repeat the same operation every time the level decreases (every week).

### *5.2.3 CHARGE LIMITS*

It is not necessary to recharge the batteries if the hydrometrics, after a work day, is not under 1,24 (28 Bè). The highest suggested temperature is 45°C. If the electrolyte temperature increases more than 10/12 °C compared to the outside temperature, the batteries can be overcharged.

### *5.2.4 OFF DUTY OR INACTIVE BATTERIES*

Inactive batteries looses their automatically their charge. If batteries do not continually work, the operator has to:

- Charge the batteries once a month with a 'final' stream intensity until gas is spread and the batteries voltage and weight are constant for 3-4 hours. This operation has to be done even if the absolute weight is high;
- Keep the batteries in a dry room.

### *5.2.5 BATTERY CHARGER TECHNICAL FEATURES*

The battery charger has to show the features listed in the scheme below:

| | |
|---|---|
| IN | 230V, 50Hz, 5A |
| OUT | 24V, 30A |

Directive:

Electromagnetic Compatibility 89/336/EC - (EN 50081 – EN 50082) and following amendment 92/31/EC

Low tension 73/23/EC – (EN 60950 class 1) and following amendment 93/68/CEE

**ATTENTION:** the operator must consult the batteries and batteries charger user manual for each problem that occur during the normal maintenance.

See § 2.3 TECHNICAL DATA for the batteries technical features.

### *5.2.6 BATTERIES DISPOSAL*

***BATTERIES DISPOSAL***

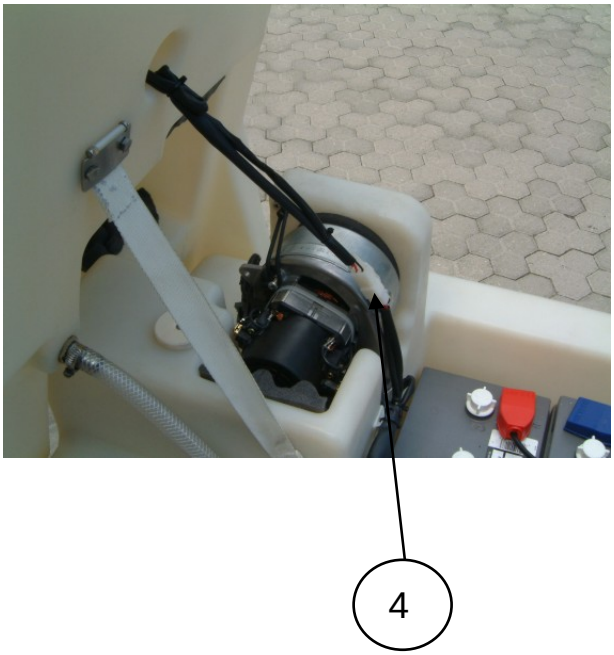
Old batteries are toxic wastes and they have to be thrown in a suitable and authorized place for the batteries disposal. For a short storage, old batteries must be located in an authorized room. Moreover, they must be stored in sealed plastic tanks, whose capacity is not lower than the electrolyte.

### *5.3 SUCTION MOTOR MAINTENANCE*

The suction motor has to be checked up and cleaned. Every six months motor brushes have to be checked and replaced if it is necessary.

To maintain the suction motor please follow the instructions below:

- Take the ignition key off the dashboard, disconnect the plug (see detail 3 in picture 5.1), remove the steel plate that fixes the suction motor and the motor itself (see detail 1 in picture 5.1);
- Remove the sponge filter under the motor, wash it and put it again in its position;
- Check the motor fan through the hole in the front side of the suction motor;
- Remove the plastic cover, loosen the screws and both the brushes supports and check the motor brushes (see detail 2 in picture 5.1);
- Do now the opposite operations to set everything up again.




**Picture5.11**

**Picture 5.1**

### *5.4 ELECTRIC EQUIPMENT CONTROL*

It is very important to check the electric system up every two years. Disconnected cables or burnt cables must be immediately replaced.

*Interventions on the electric system must be carried out by a trained technician.*
*Every kind of intervention not explained in the operator manual must be carried out by FIORENTINIs technicians.*

***Tests to be carried out***

| | HOW OFTEN | OPERATOR |
|---|---|---|
| **INSPECTION** | | |
| Safety devices | Every 2 years | Trained technician |
| Electric system | Every 2 years | FIORENTINI technician |
| Braking system | Every 3 months | Trained technician |
| Complete check up | Every 5 years | FIORENTINI technician |
| | | |
| **MAINTENANCE** | | |
| Recovery tank cleaning | Every day | Operator |
| Clean water tank | Every month | Operator |
| Suction motor filter | Every day | Operator |
| Suction pipes cleaning | Every week | Operator |
| Squeegee cleaning | Every week | Operator |
| Squeegee blades | Every week | Operator |
| Battery water level | Every week | Operator |
| Battery cables fixing | Every 6 months | Trained technician |
| Brushes in each motor | Every year | Trained technician |

### *5.6. MAINTENANCE REGISTER*

| *DATE* | *OPERATOR* | *INTERVENTION* | *SIGNATURE* |
|---|---|---|---|
| | | | |
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# 6. SERVICE

## *6.1. SERVICE ADDRESSES*

Do not hesitate to contact FIORENTINI S.r.l. service for any kind of information or request.

**ING. O. FIORENTINI s.r.l.**

**"THE BEST IN FLOOR MACHINES"**

FILIALI:
20132 MILANO – Fax. 02/2592779
Via Palmanova 211/a – Tel. 02/27207783 - 2564810
00155 ROMA – Fax. 06/22754075
Via Carlo Carrà 13 – Tel. 06/22754040-2275060
STABILIMENTO:
50030 PIANCALDOLI (FI) – Fax. 055/817144
Loc. Romboli – Tel. 055/8173610

Most of the technical problems can be sorted out with short intervention. This is why FIORENTINI S.r.l. suggest to read carefully this manual before using the machine. On the contrary, if the customer needs a FIORENTINI technician, please inform us about the problem in order to sort it out with the right material.

### *6.2 CLAIM REPORT*

Please, fill in the format below if the machine shows particular problems.

**Operator:**

Company: _____

Operator's name: _____

Role: _____

Date: _____ Signature: _____

**Machine description:**

Machine: **ET 70 RULLI** Type: _____

Purchase date: _____ S.N.: _____

Warranty: ❑ YES ❑ NO Work hours: _____

Where does the machine normally work? _____

**Fault:**

Code of the defected component: _____ Description: _____

| Fault: | Fault short description: |
|---|---|
| ❑ Mechanical component | |
| ❑ Wrong functioning | |
| ❑ Electric system | |
| ❑ Engine | |
| ❑ Missing component | |
| ❑ Estremely noisy | |
| ❑ Water leak | |
| ❑ Other | |

**Customer's suggestion:**

_____

_____

_____

Mat. n.
S.N. _____
Nr. de serie

Data di spedizione
Shipment Date _____
Date de spedition

Distributed by:


# ING. O. FIORENTINI s.r.l.

**"THE BEST IN FLOOR MACHINES"**

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Loc. Rombola – Tel. 055/8173610